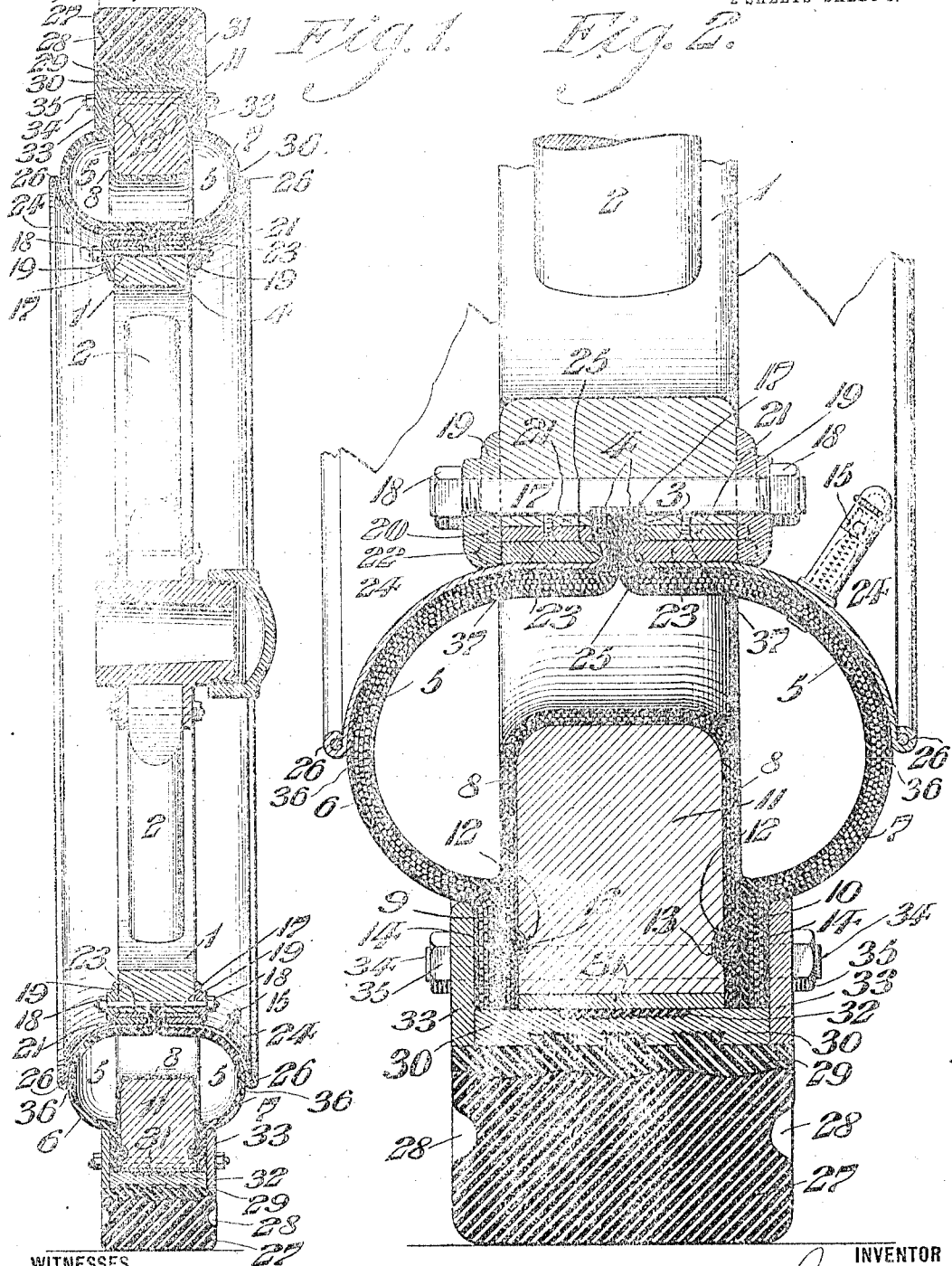


C. D. GALVIN,
RESILIENT WHEEL.

APPLICATION FILED JULY 13, 1912.

Patented Feb. 18, 1913.
2 SHEETS—SHEET 1.

1,053,723.



WITNESSES

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P. F. Nagel.

INVENTOR

BY

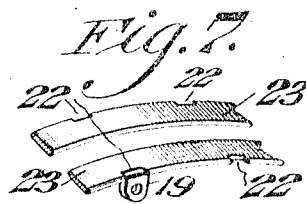
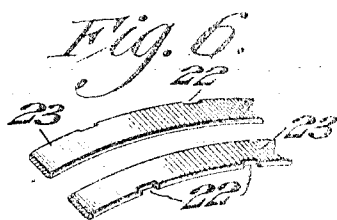
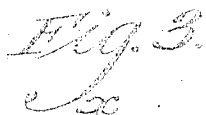
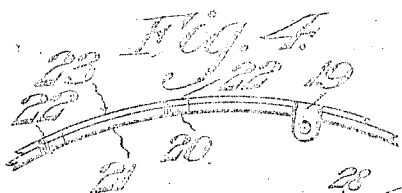
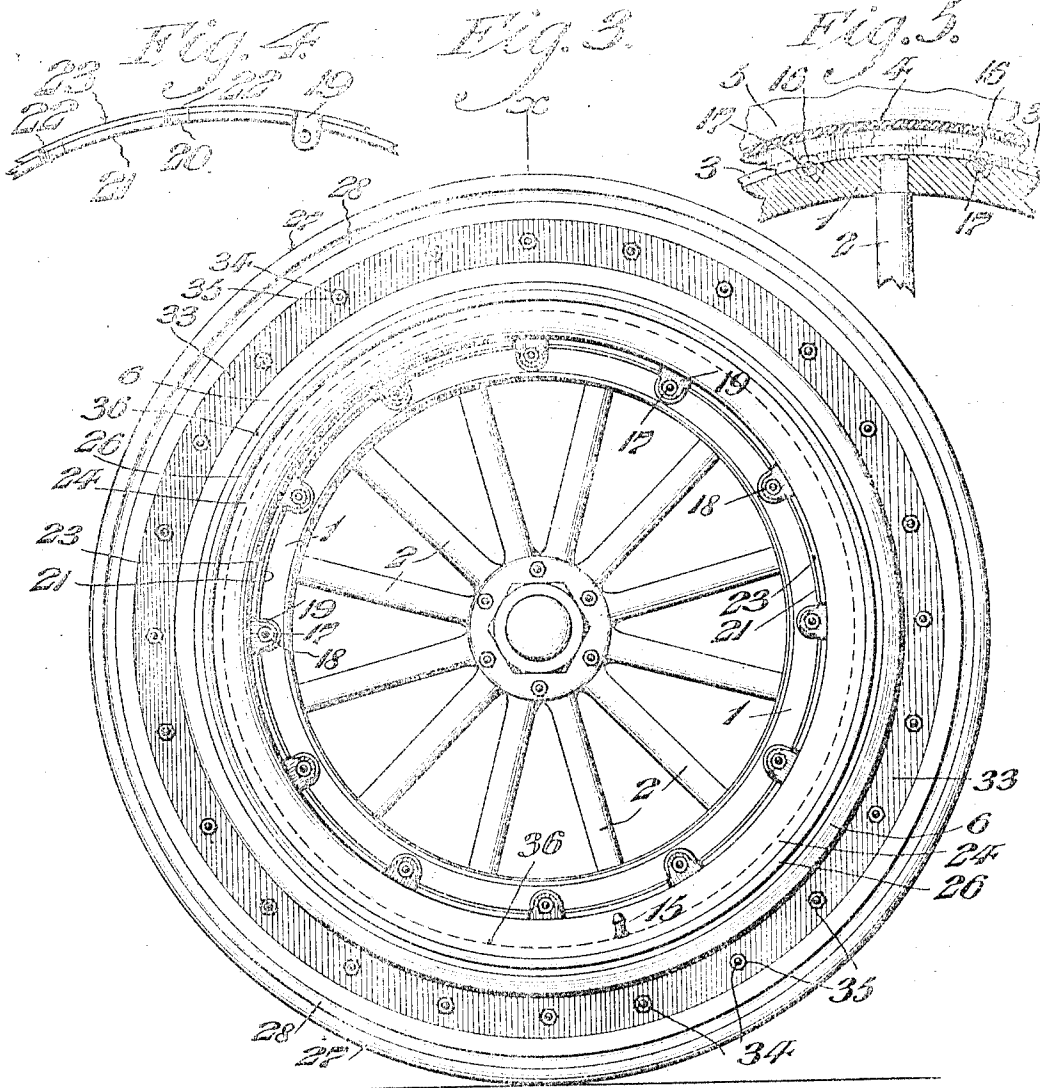
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WITNESSES

Fig. 8. *Fig. 9.*
L. Rouville, *y* 19
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UNITED STATES PATENT OFFICE.

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RESILIENT WHEEL.

1,053,723.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CARROLL D. GALVIN, a citizen of the United States, and residing at Merchantville, in the county of Camden, State of New Jersey, have invented a new and useful Resilient Wheel, of which the following is a specification.

My present invention consists of a novel construction of a resilient wheel wherein an inner and an outer felly are employed in conjunction with a novel construction of a pneumatic tube which is secured with respect to the inner and outer felly in a novel manner.

It further consists of a novel construction and arrangement of an inner and an outer felly and a novel construction of disks adapted to resiliently resist side thrust.

It further consists of a novel construction and arrangement of clamping members for preventing relative movement of certain elements of the construction.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating my invention, I have shown in the accompanying drawings a preferred embodiment which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents a sectional elevation on line *x-x*, Fig. 3, of a resilient wheel embodying my invention. Fig. 2 represents a sectional elevation thereof on an enlarged scale. Fig. 3 represents a side elevation of my device. Fig. 4 represents a side elevation of a portion of Fig. 1 in detached position, showing especially the clamping rings and their adjuncts. Fig. 5 represents a sectional view of a portion of Fig. 1, showing especially the inner felly and the pneumatic tube coacting therewith. Fig. 6 represents a perspective view of a portion of Fig. 1, showing especially the clamping rings and the recesses therein. Fig. 7 represents a perspective view similar to Fig. 6 but showing the manner of interlocking the clamping nuts with the rim recesses. Fig. 8 repre-

sents a side elevation of one of the clamping nuts. Fig. 9 represents a section on line *y-y*, Fig. 8.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings: 1 designates the inner felly which is secured to the spokes 2, in any desired or conventional manner, said felly 1 having in its outer periphery and preferably centrally located therein an annular groove 3, adapted to receive the inner terminal or terminals 4 of a pneumatic tube 5, preferably inflatable, which latter is constructed in a novel manner, as will be now clearly set forth. This inflatable tube 5 consists of two side members 6 and 7 constructed of any desired number or arrangement of layers of fabric and rubber. These side members 6 and 7 are secured near the outer periphery to a U-shaped portion 8 of the tube, constructed in a similar manner to the side members 6 and 7 and forming therewith outer terminals 9 and 10. In order to lock the terminals 9 and 10 with respect to the outer felly 11, the latter is provided with annular pockets or recesses 12 adapted to receive the beads 13, which are formed in any desired manner in the present instance by buckling or pressing the tube together, and if desired a core 14 may be employed.

15 designates a valve mechanism of the usual type in order that the tire may be inflated or deflated as desired.

It will be understood that the inner terminal 4 may be readily opened when desired, for the purpose of inspection or repairs, and this inner terminal, at desired distances apart, is slightly recessed as is indicated at 16, as will be understood most clearly by reference to Fig. 5 in order that the fastening studs 17 will interlock with said recesses 16 and prevent in a positive manner any creeping of the tire relatively to the inner felly. The studs 17 are provided at each end with a nut 18 which coöperate with a clamping member 19, the construction of which latter will be best understood from Figs. 2, 4, 7, 8 and 9. These clamping members 19 interlock with recesses 20, in the side wall of the inner rim members 21, and also with the recesses 22, in the side walls of the clamping rings 23, so that any relative movement of the rim members 21 relative to the inner felly 1 is prevented, and any relative

movement of the clamping rings 23 with respect to the inner felly 1 or the inner members 21 is also prevented.

24 designates thrust resisting side members, preferably resilient and consisting of disks, the inner ends of which are inwardly curved as at 25, in order that the clamping rings 23 may seat thereagainst. If desired the outer portions of the thrust members 24 may be reinforced by deflecting the same upon itself as is indicated at 26.

27 designates the outer tread, the tread surface of which is preferably substantially flat and the sides of the tread 27 are preferably provided with annular grooves 28. The tread 27 preferably consists of rubber which is vulcanized to a layer of hard rubber 29, which latter interlocks with a metal ring 30, against which the terminals 9 and 10 abut.

31 designates an annular ring surrounding the outer felly 11 and between this ring 31 and the ring 30 is interposed a layer of rubber 32.

33 designates clamping plates through which pass the bolts 34, which latter are provided with nuts 35, it being understood that the bolts 34 also pass through the terminals 9 and 10 and the outer felly 11.

Special attention is directed to certain novel features in my construction, it being noted that the U-shaped portion 8 of the inflatable tube 5, extends within the outer periphery of such tube 5. The pneumatic tube 5 is adapted to be opened at its inner periphery, and the inner terminals of the tube are clamped together in such a manner that a fluid tight seal is formed at such point. The outer felly 11 extends inwardly within the thrust zone of the thrust resisting side members 24.

Special attention is also directed to the novel construction of the pneumatic tube in which a portion thereof extends inwardly to be inclosed by the side walls of the tube, and attention is also directed to the novel manner of interlocking the inner and outer terminals with respect to the fellies, which in my present construction are preferably made solid.

I have found in practice that it is advantageous in some cases to employ a reinforcing annular gasket 36 preferably vulcanized into the outer side walls of the pneumatic tube 5 to reduce to a minimum the frictional wear between the side disks 26 and the tube 5. Such gasket 36 is preferably constructed of metal reinforced fabric.

The rim members 21 are shrunk on the inner felly 1 or may be secured thereto by fastening devices 37 of any desired nature.

It is not necessary in all cases to form recesses 16 in the inner terminal 4 since the same are formed by the semi-flexible terminal 4 embedding by compression the ex-

posed studs 17. The inner terminal 4 thus interlocks by compression with the studs 1 and prevents any relative circumferential movement.

The walls of the tubes are juxtaposed to the side walls of the outer felly to form opposing walls for resisting side thrust by the intervening air compression.

It will now be apparent that I have devised a novel and useful construction of a resilient wheel which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have, in the present instance, shown and described preferred embodiments thereof which have been found in practice to give satisfactory and reliable results, it is to be understood that the same are susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a device of the character stated, an inner felly having a central groove therein, an outer felly, a flexible tube having its inner terminal engaging in said groove, overhanging side disks having their inner portions juxtaposed to said terminal, and clamping means adapted to contact with said overhanging disks for securing the inner terminal of said tube in said groove.

2. In a device of the character stated, an inner felly having a central groove therein, an outer felly, a pneumatic tube having an inwardly extending substantially centrally located terminal, and two spaced outer terminals, side disks overhanging said pneumatic tube, clamping rings laterally movable toward said disks, means interlocking with said rings for clamping said disks and said inner terminal to said groove of said inner felly, said outer felly extending within the outer periphery of said tube, a tread, and means for securing said tread and said outer terminals to said outer felly.

3. In a device of the character stated, an inner felly, an outer felly, a pneumatic tube having an inner terminal interlocking with said inner felly and two spaced outer terminals on opposite sides of the outer felly, side disks overhanging said tube and having deflected portions engaging said inner terminal, clamping rings on opposite sides of the inner terminal and engaging said deflected portions, clamping members interlocking with said rings, studs passing through said inner felly and interlocking with said inner terminal, and passing through said clamping members, said outer felly extending within said tube, a tread, and means for securing said outer terminals and said tread to said outer felly.

4. In a device of the character stated, an inner felly having an annular groove in its outer periphery, an outer felly having opposite sides substantially parallel, a tube having an inner terminal secured to said inner felly and having a portion surrounding the inner periphery and parallel sides of said outer felly, whereby the outer central portion of said tube is projected within the outer periphery thereof to form air chambers on opposite sides of said outer felly, thrust resisting side plates overhanging the tube and secured to said inner felly, a tread, and means for securing said tube and said tread to said outer felly.

5. In a device of the character stated, an inner felly having an annular groove therein, an outer felly, a flexible tube having an inner terminal interlocked in said groove and outer terminals on opposite sides of said outer felly, studs carried by the inner felly and interlocking with said inner terminal, overhanging side disks contacting with said inner terminal, clamping means cooperating with said disks and said studs, a tread, and means for securing said outer terminals and said tread to said outer felly.

6. In a device of the character stated, an inner felly having a central groove therein, an outer felly, a flexible tube interlocked with said fellies and having an inwardly projected pocket at its outer portions to receive said outer felly, overhanging side disks, the inner ends of said disks terminating in proximity to said groove, laterally movable clamping devices 23 for securing said disks in position, a reinforcing annular fabric 36 located between outer portions of said disks and said tube, a tread, and means to secure said tread to said outer felly.

7. In a device of the character stated, an inner felly, an outer felly, a flexible tube interlocked with said fellies, laterally movable clamping rings 23 located intermediately of said tube and inner felly, a plurality of clamping members 19 interlocked therewith, overhanging side disks, means carried by said inner felly and cooperating with said clamping members and rings to secure said disks and said tube with respect to said inner felly, a tread, and means for securing said tread and tube to said outer felly.

8. In a device of the character stated, an inner felly having an annular groove therein, two rim members secured to said felly on opposite sides of said groove, a tube having an inner terminal seated in said groove, overhanging side disks, laterally movable clamping bands engaging therewith, clamping members interlocked with said rim members and clamping bands, securing devices carried by the inner felly, interlocking with said inner terminal, and cooperating with said clamping members, an outer

felly, projecting within said tube and secured thereto, and a tread carried by said outer felly.

9. In a device of the character stated, an inner felly having a central groove therein, an outer felly having an annular groove on each side thereof, a pneumatic tube having an inner terminal interlocking with the walls of a groove in said inner felly and having two spaced outer terminals provided with beads interlocking with the annular grooves of said outer felly, said outer felly being projected within the outer periphery of said tube, overhanging side disks, laterally movable clamping rings for securing said side disks and said inner terminal with respect to said inner felly, a tread carried by said outer felly, and means for securing said terminals to said outer felly.

10. In a device of the character stated, an inner felly having a substantially centrally located groove therein, an outer felly, a pneumatic tube having an inner terminal interlocking with said groove of said inner felly and two outer projecting terminals engaging opposite sides of said outer felly, side disks overhanging said tube and having inwardly deflected portions engaging said inner terminal, laterally movable clamping devices on opposite sides of said inner terminal and engaging said deflected portions, an outer tread and means for securing said outer tread to said outer felly.

11. In a device of the character stated, an inner felly having an annular groove therein, an outer felly, a pneumatic tube having an inner terminal interlocking with said inner felly and its outer portion in engagement with said outer felly whereby the outer central portion of said tube is projected within the outer periphery thereof, to form air chambers on opposite sides of said outer felly, overhanging side plates having their inner ends contacting with said inner terminal, clamping rings 23 located between said inner felly and said side plates, clamping members 19 interlocked with said rings, and transverse fastening devices for securing said members 19 and rings 23 in assembled position.

12. In a device of the character stated, an inner felly having a groove therein, an outer felly, a pneumatic tube located between said fellies and having an inner terminal engaging said groove, thrust resisting side plates having inner portions engaging said inner terminal, annular clamping rings 23 located intermediate of said plates and said inner felly on each side of said inner terminal, and laterally movable with respect thereto, means for locking said rings with respect to said inner terminal and side plates, an outer tread and means for securing said outer tread with respect to said tube and outer felly.

13. In a device of the character stated, an inner felly, an outer felly, a tube having an inner terminal secured to said inner felly, and having a portion engaging the inner periphery and side walls of said outer felly, whereby the outer central portion of said tube is projected within the outer periphery thereof to form air chambers on opposite sides of said outer felly, thrust resisting side plates overhanging said tube and secured to said inner felly, annular clamping devices for said inner terminal, located intermediate of said side plates and inner felly, clamping members engaging with said annular clamping device, means for retaining said clamping devices in assembled position, a reinforcing strip 36 for the sides of said tube located in juxtaposition to said side plates, an outer tread and means for securing said outer tread to said outer felly.

14. As a new article of manufacture, a pneumatic tube having an outer, central, annular, inwardly projecting pocket having substantially parallel side walls and inflatable portions 6 and 7 at opposite sides of said pocket and projecting laterally therefrom, flanges projecting radially, outwardly, from said tube portion and secured to said

tube, said flanges being prolonged to form an outward extension of said outer pocket, the inner portions 6 and 7 of said tube being curved inwardly and abutting to form at their juxtaposed positions, an inwardly extending, substantially central, annular terminal 4, adapted to engage a corresponding groove of a wheel felly.

15. As a new article of manufacture, a pneumatic tube having an outer, central, annular, inwardly, projecting pocket having substantially parallel side walls and inflatable portions 6 and 7 at opposite sides of said pocket and projecting laterally therefrom, flanges projecting radially, outwardly, from said tube portion and secured to said tube, said flanges being prolonged to form an outward extension of said outer pocket, the inner portions 6 and 7 of said tube being curved inwardly and abutting to form an inwardly extending, substantially central, annular terminal, and a metal reinforced fabric 36 vulcanized to the outer side walls 6 and 7 of said pneumatic tube.

CARROLL D. GALVIN.

Witnesses:

H. S. FAIRBANKS,
C. D. McVAY.